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### **Antimatter Plasmas in the Laboratory<sup>1</sup>**

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The focus of this talk is the creation and uses of nonrelativistic positron plasmas and beams. Key plasma physics drivers for this research will be described, centered on techniques to create and manipulate antimatter plasmas and gases; and outstanding challenges will be discussed. Areas of progress and future promise will be described, including the formation and study of antihydrogen (stable neutral antimatter); positron binding to ordinary matter; and efforts to study the electron-positron many-body system in both the quantum and classical regimes, Bose-condensed gases of positronium atoms (Ps BEC) and classical electron-positron (“pair”) plasmas.

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